RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 41-11-09

Log Event A

Borehole Information

Farm : SX **Tank :** SX-111 **Site Number :** 299-W23-95
N-Coord : 35,253 **W-Coord :** 75,814 **TOC Elevation :** 661.63
Water Level, ft : **Date Drilled :** 3/12/1962

Casing Record

Type : Steel-welded **Thickness :** 0.280 **ID, in. :** 6
Top Depth, ft. : 0 **Bottom Depth, ft. :** 75

Equipment Information

Logging System : 2 **Detector Type :** HPGe **Detector Efficiency:** 35.0 %
Calibration Date : 03/1995 **Calibration Reference :** GJPO-HAN-1

Logging Information

Log Run Number : 1 **Log Run Date :** 7/5/1995 **Logging Engineer:** Mike Widdop
Start Depth, ft.: 0.0 **Counting Time, sec.:** 100 **L/R :** L **Shield :** N
Finish Depth, ft. : 75.0 **MSA Interval, ft. :** 0.5 **Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : D.C. Stromswold

Data Processing Reference : Data Analysis Manual Ver. 1 Analysis Date : 11/15/1995

Analysis Notes :

Borehole 41-11-09 was logged in a single run in a move-stop-acquire mode that collected spectra for 100 seconds every 0.5 ft. Gain drifts during the run made it necessary to process the data in three segments with different energy calibrations to maintain proper radionuclide identification.

Verification spectra collected before and after the run showed that the tool was operating correctly.

Correction factors for 0.25-in.-thick-steel casing were used during data processing.

Cs-137 was the only man-made radionuclide identified in this borehole, occurring from the surface down to about 7 ft and from about 62 to 75 ft. The concentrations were less than 10 pCi/g, except at the surface (where the tool is not calibrated because of the nonborehole geometry). The apparent increase at 75 ft might be related to direct shine from the bottom of the hole where the gamma rays are not attenuated by the open casing.

The K, U, and Th logs indicate several lithology changes in the interval from 58 to 73 ft. The shape of total gamma-ray curve, especially below about 58 ft, appears to be controlled mainly by its Th component.

For additional log data interpretation, see the discussion for this borehole included in the Tank Summary Data Report for SX-111 .

Log Plot Notes:

Three log plots are provided. One shows the Cs-137 concentrations. Another shows the naturally occurring radionuclides (K-40, U-238, and Th-232), which can be used for lithology interpretations. A combination plot includes logs of Cs-137, natural gamma, total gamma derived from the spectral data, and the latest available data from the WHC Tank Farms gross gamma logging. The headings of the Cs-137 and natural gamma plots identify the specific gamma-rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detectable activity (MDA). The MDA of a radionuclide represents the lowest concentraton at which positive identification of a gamma-ray peak is statistically defensible. If the reported concentration is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and detection is not assured with 95-percent certainty.

The Tank Farms gross gamma plot is the latest available from WHC. No attempt has been made to adjust the plot for depth discrepancies.